



INSTALLATION RESTORATION PROGRAM

June 2000



Proposed Plan for Soil Interim Remedial Action at Site/SWMU 3

Marine Corps Recruit Depot Parris Island, South Carolina

Facility Description

Marine Corps Recruit Depot (MCRD) Parris Island, South Carolina (see Figure 1) is the reception and recruit training facility for the Marine Corps for enlisted men from states east of the Mississippi River and for enlisted women nationwide. The Depot is located along the southern coast of South Carolina, approximately 1 mile south of the City of Port Royal and 3 miles south of the City of Beaufort within Beaufort County and occupies an area of approximately 8,047 acres. MCRD Parris Island was added to the National Priorities List (NPL) in 1994.

Island and is an integral part of a causeway connecting Horse Island and Parris Island, as shown in Figure 2. The causeway is currently covered with one to two feet of vegetated soil over most of its length. The causeway is a primarily gravel, two-lane road overlying layers of solid waste, fill dirt, and debris constructed through a tidal marsh of the Broad River (across Ribbon Creek). The causeway is approximately 10 acres in size, 4,000 feet long, 100 feet wide and 3 to 10 feet high (above the pond water surface). The sides of the causeway consist of riprap, vegetated soil cover, and eroded waste material. Site/SWMU 3 (Site 3) functioned as the major disposal area for municipal trash and other materials discarded in dumpsters around the MCRD during most of the period between 1960 and 1972.

Site Description

Site/Solid Waste Management Unit (SWMU) 3, Causeway Landfill, is located in the northwestern portion of MCRD Parris

The Interim Remedial Action Proposal

The proposed interim remedy for Site 3 includes the following components:

- The sides of the causeway would be stabilized with regrading, vegetation, riprap, and/or gabions. These actions would minimize waste erosion into the environment resulting from water runoff, waves and/or wind.
- Soil would be added to the top and sides of the causeway to ensure that a minimum of two feet of compacted cover would be present over waste materials in order to comply with federal and South Carolina landfill regulations (i.e., 2 feet minimum of soil cover thickness over waste materials). The 2 feet of soil cover over wastes would protect human health by reducing the incremental lifetime cancer risk (ILCR) level to one in one million (1.0E-06) or less. In other areas of the causeway, 1 foot of additional soil cover would be placed. The additional soil cover would protect terrestrial wildlife. These two actions would result in additional soil cover over approximately two-thirds of the causeway's length. The balance of the causeway waste is currently covered by at least 2 feet of cover soil.
- After the sides of the causeway are stabilized and the soil cover has been placed, a paved road would be constructed that would reduce precipitation infiltration into the waste and reduce erosion of cover material. Also, sediment on the pond side of the causeway would be re-characterized. These sediments will be addressed in a future proposed plan and record of decision (ROD).
- Land use controls would be implemented to control exposure pathways to chemicals of concern (COCs) through the Land Use Control Implementation Plan (LUCIP) and Land Use Control Assurance Plan (LUCAP). Long-term monitoring would consist of annual groundwater testing for the first 5 years. A re-evaluation of the site would be performed every 5 years to determine whether changes to the site restrictions and monitoring frequency would be required. Periodic inspections would be conducted to ensure the long-term integrity of the remedy and effectiveness of the land use controls.

In accordance with CERCLA Section 117, this document summarizes the planned Interim Remedial Action for Site/SWMU 3 at MCRD Parris Island. For detailed information on the options evaluated for Site 3, consult the Site 3 documents contained within the Administrative Record, which is available for review at the information repository located at the Beaufort County Public Library's Headquarters Location 311 Scott Street, Beaufort, South Carolina 29902.

This Document

In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the law that established the Superfund program and the National Contingency Plan (NCP), 40 CFR §300.430(f)(2), this document summarizes the U.S. Navy's proposal for site remedial action to help the public understand and comment on the proposed interim remedy and all alternative actions which were evaluated. This plan was developed by the MCRD Parris Island and Southern Division, Naval Facilities Engineering Command (NAVFAC) and was presented to the MCRD Parris Island Partnering Team for review. This Partnering Team for MCRD Parris Island, established in 1996, consists of representatives from the Marine Corps – MCRD Parris Island, United States Environmental Protection Agency (U.S. EPA), and South Carolina Department of Health and Environmental Control (SCDHEC). In 1997, representatives of the National Oceanic and Atmospheric Administration (NOAA), South Carolina Department of Natural Resources (SCDNR), and U.S. Fish and Wildlife Service joined the team as natural resource trustees. The Partnering Team was formed to facilitate the development, review, and approval of work plans, reports, and decision documents. The MCRD Parris Island, NAVFAC, U.S. EPA, and SCDHEC, in consultation with the local community, will select an interim soil remedy for Site 3 after all public comments to this proposed plan have been addressed. Sediment will be addressed at a later date. One of the purposes of this proposed plan is to solicit the public's views and comments on all the alternatives described. This

plan highlights the key information from the remedial investigation/RCRA facility investigation (RI/RFI) and feasibility study/corrective study measures (FS/CMS) reports but is not a substitute for these documents. More detailed information can be found in the Administrative Record.

What do you think?

The U.S. Navy, as the lead agency, is accepting formal public comments on this proposal from June 9, 2000 to July 27, 2000. You don't have to be a technical expert to comment. If you have a concern or preference, the MCRD Parris Island and NAVFAC want to hear it before making a final decision on how to protect your community. To comment formally, offer oral comments during the comment portion of the public meeting (see page 10 for details). All comments will be considered and will receive a reply. Otherwise, send written comments, postmarked no later than July 27, 2000, to

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Site History

Following is a brief history of Site 3:

- 1960s-1972: The causeway was constructed of layers of solid waste, fill dirt, and debris. The solid waste disposed at the site reportedly included municipal trash with small amounts of empty pesticide containers, oily rags, spent absorbent, petroleum and chlorinated solvent sludge, perchloroethylene still bottoms, mercury amalgam and beryllium waste, polychlorinated-biphenyl (PCB)-contaminated oil, and metal shavings.
- 1986 - 1990: Several preliminary studies were conducted that identified Site 3 as a site with the potential to pose threats to human health or the environment.
- 1998 - 1999: A field investigation for the RI/RFI was performed. The final RI/RFI report was issued to the Partnering Team in November 1999 and summarizes the nature and extent of contamination at Site 3 and characterizes the risks posed to human health and the environment by Site 3.
- 1999 - 2000: An FS/CMS was completed. Based on evaluation of site conditions, risks, and legal requirements that may be either applicable or relevant and appropriate requirements (ARARs), remedial action objectives (RAOs) were identified to protect human health and the environment

A Closer Look at Proposed Interim Remedy

1. Slope Stabilization and Erosion Control

The sides of the entire causeway would be stabilized with regrading, compacted fill, vegetation, riprap, and/or gabions. These actions would minimize the potential further erosion of causeway wastes due to the actions of rain runoff, waves, and/or wind to the pond and marsh. Limited sediment excavation or covering of the sediments along the base of the causeway would occur as part of these measures. The sediment areas addressed by slope stabilization include the most contaminated sediments found at Site 3. Addressing these sediments would eliminate most of the site risks identified to human and ecological receptors by sediment exposure.

2. Soil Cover

As shown on Figure 2, additional compacted soil cover would be placed over approximately two-thirds of the causeway to minimize the potential for human and ecological contact with waste and impacted soil. Additionally, these actions would be conducted to minimize the migration of contaminants to nearby surface water and sediment due to runoff, waves, and/or wind. The proposed interim remedy includes ensuring a minimum of 2 feet of compacted soil cover over waste materials. This action is being conducted to protect human health and the environment. The 2 feet of compacted soil cover would protect human health by reducing incremental lifetime cancer risk to less than one in one million (1.0E-06). The proposed interim remedy also includes an additional 1 foot of soil cover over existing soil that poses moderate to high risks to terrestrial wildlife. The additional soil cover would protect terrestrial wildlife to a moderate level (minimum of clean-up goals that correspond to a low-observable-effects threshold hazard quotient of 1.0 and/or Dutch Soil Clean-up Act "B" values). Except for soil macroinvertebrates (e.g., worms), moderate risk values are considered protective of most terrestrial ecological receptors. The balance of the causeway waste is currently covered by 2 feet of vegetated cover soil.

3. Roadway Construction/Sediment Testing

A paved road would be constructed that would reduce precipitation infiltration into the waste and reduce erosion of cover material. Also, sediment on the pond side of the causeway would be re-characterized. These sediments will be addressed in a future proposed plan and record of decision (ROD).

4. Land Use Controls and Long-Term Monitoring

Land use controls would be implemented to control or eliminate pathways of exposure to COCs at the site. Prohibitions on unauthorized intrusive/construction activity would be implemented. Additionally, current site restrictions regarding prohibitions on swimming and wading would be maintained. Through the site's land-use control implementation plan (LUCIP) and land use control assurance plan (LUCAP) residential development of the site and use of the site's groundwater as potable

water would also be prohibited. Periodic inspections would be conducted to ensure the long-term integrity of the remedy and effectiveness of the land use controls. Also, to verify the effectiveness of the proposed interim remedy, a monitoring program would be established that consists of annual groundwater testing for the first 5 years. Four groundwater samples would be collected each year and analyzed for Target Compound List (TCL) organics and Target Analyte List (TAL) inorganics. A re-evaluation of the site would be performed every 5 years to determine whether changes to the site restrictions and monitoring frequency would be required.

Scope and Role of Soil Interim Response Action

Site 3 - Causeway Landfill is one of approximately 45 sites being evaluated for potential contamination at the MCRD Parris Island. This interim response action is the first action being taken at Site 3 - Causeway Landfill and specifically addresses buried wastes and contaminated soils. Groundwater at this site has only been slightly impacted by site contaminants. Since the groundwater is not usable as a potable water supply and other groundwater contact pathways are minor, the groundwater does not represent a significant risk to human receptors. In addition, the proposed interim remedy will reduce migration of contaminants to groundwater.

Some of the contaminated sediments at Site 3 are being addressed as part of the bank stabilization portion of the interim remedy. A final ROD for the site will specifically address the remaining contaminated sediments. Surface water at the site has been slightly impacted by site contaminants. The proposed interim remedy will prevent migration of contaminants from the soils and wastes to the surface water. The surface water will be further addressed with the remaining contaminated sediments.

Summary of Site Risks

Potential environmental risks associated with this site were evaluated for human health and ecological receptors. The risk estimates were based on receptor (e.g., human, eagle, raccoon), duration of exposure (e.g., 1 day per week), pathway (e.g., ingestion of fish or soils), ingestion rates (pounds per day), and representative concentration of contaminants. The estimated risks were then compared to established criteria for evaluation.

Human Health

For human health, risk estimates are divided into carcinogenic and non-carcinogenic concerns. For carcinogenic risks, a range of 1 in 10,000 (1.0E-04) to 1 in 1,000,000 (1.0E-06) incremental lifetime cancer risk (ILCR) is considered to be acceptable by the U.S. EPA. For non-carcinogenic concerns, the U.S. EPA threshold value Hazard Index (HI) is 1.0.

Human health concerns evaluated at the site were construction workers, maintenance workers, and recreational harvesting

of shell fish and fin fish at the site. Each of these activities occurs at the site on a regular basis. A construction worker was assumed to be in contact with surface soil for 6 months and to groundwater, surface water, and sediment for 1 month. A maintenance work was assumed to be in contact with soils 1 day per week and sediment 1/2 day per week for 25 years. The baseline human health risk assessment found that, without implementation of site-specific requirements, ILCR estimates for construction and maintenance workers would be 1.7E-05 and 5.9E-05, respectively. The contaminants driving these risks were polynuclear aromatic hydrocarbons (PAHs) - commonly found in asphalt and arsenic. These risks are within the U.S. EPA acceptable risk range. The HIs for these receptors were less than 1.0, indicating that non-carcinogenic effects would not be expected.

Potential health effects associated with recreational harvesting and consumption of shell fish and fin fish at the site were estimated under several scenarios. The factors considered include the quantity of fish consumed, the bioaccumulation of contaminants in the fish, and the forage area of the fish. These scenarios represent a range of conservativeness to address unknowns in the database. Under the two most representative scenarios for this site, using measured fish tissue and mean site data coupled with site-specific fish consumption rates (weekly fish consumption over a 6 year period), ILCR estimates for receptors would be 3.5E-06 to 1.4E-05. These risks are within the U.S. EPA acceptable risk range. The HIs for this receptor were less than 1.0, indicating that non-carcinogenic effects would not be expected.

SITE 3 - HUMAN HEALTH RISK ASSESSMENT SUMMARY

Receptor	Media	Exposure Route	ILCR	Index Index	
Construction Worker	Soil	Ingestion	1.8E-06	0.16	
		Dermal Contact	4.7E-06	0.06	
		Total	6.5E-06	0.22	
	Groundwater	Dermal Contact	4.0E-08	0.06	
	Sediment	Ingestion	1.3E-07	0.05	
		Dermal Contact	2.6E-07	0.01	
		Total	4.0E-07	0.06	
	Surface Water	Ingestion	1.4E-07	0.05	
		Dermal Contact	1.0E-05	0.09	
		Total	1.0E-05	0.14	
			Total All Media	1.7E-05	0.47
	Maintenance Worker	Soil	Ingestion	3.7E-06	0.01
Dermal Contact			4.7E-05	0.02	
Total			5.1E-05	0.04	
Sediment		Ingestion	8.2E-07	0.01	
		Dermal Contact	7.9E-06	0.01	
		Total	8.7E-06	0.03	
		Total All Media	5.9E-05	0.06	
Recreational Users	Fish (Measured Tissue)	Conservative	5.0E-05	2.4	
		Site-Specific	3.5E-06	0.83	
	Fish (Calculated Sediment/Surface Water - Maximum Concentration)	Conservative	1.8E-03	18	
		Site-Specific	1.3E-04	6.1	
	Fish (Calculated Sediment/Surface Water - Average Concentration)	Conservative	2.0E-04	2.2	
		Site-Specific	1.4E-05	0.76	

Conservative: U.S. EPA Region IV default parameters (see Table 6-18)

Site-Specific: Values based on site specific conditions (see Table 6-18)

Under other scenarios for recreational harvesting of fin fish and shell fish, the human health risk estimate exceeded an ILCR of 1.0E-04 and an HI greater than 1.0. These scenarios assume higher concentrations of contamination in the pond sediments and daily fish consumption a over 30 year period. The risks calculated under this scenario are not considered to be acceptable by the U.S. EPA. Site chemicals contributing to these exceedances are PAHs, PCBs, pesticides, and arsenic. Risks estimates are summarized above.

Ecological Risks

For ecological receptors, potential impacts were considered for benthic macro invertebrates (e.g., aquatic worms), aquatic receptors (e.g., fish, heron, eagle), and terrestrial receptors (e.g., shrew, robin). To evaluate the data, a range of screening criteria is available, from very conservative to site-specific conditions. The initial screening criteria are based the U.S. EPA Region 4 ecological screening values for soils and sediments. These values are considered to be protective of all species, including benthic macro invertebrates. These values are established at very low levels, and background concentrations (natural or anthropogenic) are commonly higher. Chemicals that are present at levels below these screening values do not normally require additional evaluation. For Site 3, PAHs, pesticides, PCBs, and several metals, including arsenic, lead, mercury, vanadium, and zinc, exceeded the screening levels in both soils and sediments.

The next level of evaluation in the ecological risk assessment is a comparison of the data to “no observed adverse effects levels” (NOAELs). The NOAELs represent dosages to higher level ecological receptors (e.g., shrew, heron, raccoon) for which adverse impacts are not normally anticipated. For each receptor, a hazard quotient is calculated based on a receptor’s intake of a chemical through consumption of contaminated food and sediment, surface water, and soils. A hazard quotient of less than 1.0 indicates that adverse effects for that receptor would not be expected. Based on food chain modeling conducted for this site, chemicals that exceed a NOAEL hazard quotient equal to 1.0 at one or more locations for one or more receptors are pesticides, PCBs, and several metals.

The next step in an ecological risk assessment is to refine the evaluation to more accurate site-specific factors. This refinement takes into account site background concentrations for metals, mean site chemical concentrations, home range

factors for receptors, and consideration that most metals do not bioaccumulate.

For the Feasibility Study, three categories of ecological risk goals were developed, low, moderate, and high. The low risk values correspond to the lowest screening values available and generally represent chemical concentrations at which adverse impacts to ecological receptors including soil invertebrates, plants, and food chain receptors would not be expected. At chemical concentrations greater than the low risk values, some adverse risks to sensitive organisms may occur. The low risk values are very conservative and most sample locations exceed one or more of these values. Moderate risk levels correspond to chemical concentrations at which adverse impacts to ecological receptors are likely. At concentrations greater than the moderate risk level, adverse impacts to invertebrates, plants, and food chain receptors would be expected with the degree of impact related to the contaminant concentration and effected area. Approximately two thirds of the soil sample locations at Site 3 exceed the moderate risk values. The high risk values are approximately 10 times the moderate risk values, and were calculated to help identify soil hot spots. Less than 10% of the sample locations exceeded the high risk goals. Low, moderate, and high risk values are modified to eliminate background and typical facility concentration effects.

Use of Applicable or Relevant and Appropriate Requirements in Evaluation Process

Applicable or relevant and appropriate requirements (ARARs) are federal and state environmental requirements used to evaluate the appropriate extent of site clean up, scope and formulate remedial alternatives, and control the implementation and operation of a selected remedial action. Potential chemical-, location-, and action-specific ARARs are defined in the FS/CMS for Site 3 dated May 2000. Each alternative was evaluated to determine its compliance with ARARs. Chemical-, location-, and action-specific ARARs that apply to Site 3 are presented in Section 3.0 of the FS/CMS.

Site 3 Ecological Risk Assessment Summary - Current Conditions

Receptor	Exposure Route	Risk Estimates
Terrestrial Plants and Soil Invertebrate	Direct contact, ingestion of soil and prey.	EPA Region IV Screening Values ¹ , Maximum HQ: 51
Food Chain Receptors	Direct contact, ingestion of soil and prey.	Food Chain Modeling, Maximum HQ ¹
- Shrew		25
- Mouse		40.9
- Robin		45
- Hawk		6.3

1 Maximum hazard quotient result does not include aluminum.

What are the Clean-up Objectives and Levels?

Using the information gathered during the investigations and the results of the baseline risk assessment, the following remedial action objectives (RAOs) were established for Site 3 soils:

- Control human exposure (the existing maintenance worker, future construction worker, and recreational user) to COCs in surface soil.

- Control exposure of ecological receptors to COCs in surface soil.
- Eliminate the migration of COCs from the fill material to sediment, surface water, and groundwater.
- Comply with chemical-specific, location-specific, and action-specific federal and state ARARs.

Soil remediation goals were chosen that represent an ILCR of 1.0E-06 and that provide moderate risk level protection to ecological receptors. The following soil COCs that currently exceed these soil clean-up goals are as follows:

Site 3 Soil COCs	Range of Detections 1998-1999 RI/RFI	Site-3 Soil Clean-up Levels	Basis
Semivolatile Organic Compounds (µg/kg)			
Benzo(a)anthracene	3 – 3,000	1,000	Ecological ⁽¹⁾
Benzo(a)pyrene	4.1 – 4,000	890/1,000	Human Health ⁽²⁾ / Ecological ⁽¹⁾
Benzo(b)fluoranthene	2.2 – 3,400	1,000	Ecological ⁽¹⁾
Benzo(g,h,i)perylene	9.3 – 2,500	1,000	Ecological ⁽¹⁾
Benzo(k)fluoranthene	1.7 – 1,300	1,000	Ecological ⁽¹⁾
Chrysene	3.6 – 2,900	1,000	Ecological ⁽¹⁾
Indeno(1,2,3-cd)pyrene	2.6 – 2,600	1,000	Ecological ⁽¹⁾
Inorganics (mg/kg)			
Arsenic	0.44 – 11.8	7.79	Ecological ⁽³⁾
Lead	5.5 - 264	61.9	Ecological ⁽³⁾
Mercury	0.0375 – 0.43	0.11	Ecological ⁽⁴⁾
Zinc	5.7 - 205	95.5	Ecological ⁽³⁾

- Dutch Soil Clean-Up Act "b" values
- Site-specific Human Health Remedial Goal Options - ILCR = 1.0E-06
- Clean-up goal that corresponds to a low-observable-effects threshold HQ = 1.0
- MCRD background value

Clean-up Alternatives for Site 3

The FS report presents the options that the U.S. Navy considered for clean up of Site 3. Although the FS considers clean-up of both Site 3 soils and sediment, this proposed plan addresses only Site 3 soils. Site 3 sediment will be addressed at a later date. The clean-up options, referred to as "Clean-up Alternatives," are different combinations of plans to restrict access and to contain, remove, or treat contamination in order to protect public health and the environment.

During the upcoming public comment period, the MCRD Parris Island welcomes your comments on the proposed clean-up plan and on the other technical approaches that were evaluated. These clean-up alternatives are summarized below. Please consult the FS/CMS report for more detailed information.

Based on information currently available, the preferred alternative, Modified Alternative 3a, provides the best balance of trade-offs among the other alternatives, with respect to the evaluation criteria.

Clean-Up Alternatives

NO ACTION

- Alternative 1 – No Action: Evaluation of the no-action alternative is required by law as a basis for comparison with other alternatives. No remedial action would be taken to eliminate risks to human health and the environment. Concentrations of contaminants in soils may eventually be reduced to clean-up levels through natural attenuation processes but no monitoring would be performed to quantify this reduction. As existing soil cover erosion continues, contaminant levels may actually increase in soils

and sediment. Mechanisms would not be in place to determine whether the alternative would comply with ARARs or achieve RAOs.

Containment

- Each of the containment alternatives include roadway construction, bank stabilization, covering of site wastes, land use controls, and long term monitoring. The alternatives differ in how much soil cover is placed and whether sediments will be further addressed.

- Alternative 2a – Partial Containment: This alternative would serve primarily to protect humans from exposure to contaminated soil and the contents of the landfill. This protection would be achieved by assuring that a minimum of 2 feet of clean soil cover is present over waste material and that the sides of the causeway are stable. In areas where a concern to terrestrial ecological receptors is present but only under a *high-risk* scenario, 1 foot of soil cover would be placed over existing soil. The soil cover described in this alternative would be placed over the southeastern half of the causeway. As part of the bank stabilization, excavation or covering of the sediments found to be the most contaminated would occur (sediments adjacent to the causeway). After construction, the cover would be inspected after major storm events and annually to ensure the integrity of the cover.
- Alternative 2b – Full Containment: This alternative would also serve to protect humans from exposure to contaminated soil and the contents of the landfill. This protection is achieved by assuring that a minimum of 2 feet of soil cover is present over waste material and that the sides of the causeway are stable. Alternative 2b provides equal protection to human health as Alternative 2a; however, Alternative 2b is more protective of ecological receptors. In areas where a concern to terrestrial ecological receptors is present even under a *low-risk* scenario, a minimum of 1 foot of soil cover would be placed over existing soil. As a result of the evaluation, the soil cover described in this alternative would be placed over the entire length of the causeway. As part of the bank stabilization, excavation or covering of the sediments found to be the most contaminated would occur (sediments adjacent to the causeway). After construction, the cover would be inspected after major storm events and annually to ensure the integrity of the cover.
- Alternative 3a – Partial Containment with Further Sediment Evaluation: Alternative 3a consists of all the components of Alternative 2a; however, Alternative 3a also contemplates the supplemental delineation of sediment found on the pond side of the causeway.
- Modified Alternative 3a – Partial Containment with Further Sediment Evaluation: Alternative 3a is modified to include a minimum of 1 foot of soil cover over soils that present a *moderate-risk* to ecological receptors in lieu of only addressing *high-risk* soils. This would involve placing a soil cover over approximately two thirds of the causeway.
- Alternative 3b – Full Containment with Further Sediment Evaluation: Alternative 3b consists of all the components of Alternative 2b; however, Alternative 3b also contemplates the supplemental delineation of sediment found on the pond side of the causeway.

Figure 3 provides typical cross sections illustrating the slope stabilization and erosion control measures and the soil cover common to all action alternatives.

What impacts would the Interim Remedial Action have on the local community?

- All the alternatives, except Alternative 1: No Action, include the temporary closure of the causeway. This action would disrupt traffic flow at MCRD Parris Island. Closure of the causeway, however, would last only until construction is complete.
- Soil and sediment contact by workers during activities under Alternatives 2a, 2b, 3a, modified 3a, and 3b is possible. Health and safety training and proper personal protective equipment usage would minimize potential for risk to site workers.

Why Does the U.S. Navy Recommend the Interim Remedy Modified Alternative 3a?

After careful consideration and investigation, the U.S. Navy's recommended interim remediation for this site is a modified Alternative 3a. The modification put forth is thus: rather than placing soil cover on areas where there is an ecological high risk, soil cover would also be placed in areas where a moderate to high risk exists. This interim remedy is recommended for the following reasons:

- Minimizes human and ecological exposures to impacted surface soil where concentrations of contaminants represent human health ILCR greater than 1.0E-06 or moderate risk to terrestrial wildlife.
- Provides a minimum of 2 feet of soil cover over existing waste materials within the causeway structure, making it consistent with federal and South Carolina regulations.
- Stabilizes the sides of the causeway, eliminating further impact to the soils and sediments of the site.

The U.S. EPA and SCDHEC (as support agencies) concur with the preferred alternative for the interim remedy. It is the U.S. Navy's judgement that the preferred alternative is necessary to protect public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment. The U.S. Navy believes that the preferred alternative satisfies the statutory requirements in CERCLA Section 121(b), which states that the selected alternative be protective of human health and the environment, comply with ARARs, be cost-effective, utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfy the statutory preference for treatment as a principle element.

Next Steps:

By September 15, 2000, the MCRD Parris Island expects to have reviewed all comments and signed the document describing the chosen interim remedial action plan. An interim ROD, which includes a summary of responses to public comments, will then be made available to the public at the

Beaufort County Public Library's Headquarters Location. The MCRD Parris Island will also announce the U.S. Navy's decision through the local news media and the community mailing list. To be added to the community mailing list, please use the attached form.

Comparison of Soil Clean-up Alternatives

In the FS, each alternative was evaluated against several criteria. Threshold criteria (protection of human health and the environment and compliance with ARARs) are requirements that each alternative must meet in order to be eligible for selection. Primary balancing criteria (long-term effectiveness, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability, and cost) are used to weigh major trade-offs among alternatives. Modifying criteria (state acceptance and community acceptance) are of equal importance to the balancing criteria during the final balancing of trade-offs between alternatives. This section presents a summary comparison of the alternatives to these criteria.

Protection of Human Health and the Environment

- Alternatives 2a, 2b, 3a, and 3b provide equal protection to maintenance and construction workers and recreational user through the covering of waste and impacted soil with cover material. Alternative 1 would not be protective of human health.
- The action alternatives provide varying levels of protection to terrestrial wildlife. Based on the areal extent of the soil cover provided in the action alternatives, Alternatives 2b and 3b provide the most protection to terrestrial wildlife, followed by modified Alternative 3a, and then Alternatives 2a and 3a. Alternative 1 may not be protective of terrestrial wildlife.
- Bank stabilization and erosion control measures associated with the action alternatives will minimize the migration of wastes and impacted soil into the surrounding sediment and surface water; thereby, reducing human health and ecological exposure risks. Furthermore, risks would be reduced because implementation of these actions would involve excavating or covering sediment adjacent to the causeway (the most contaminated sediment). Alternative 1 would not provide such protection.

Compliance with ARARs

- Alternatives 2a, 2b, 3a, modified 3a, and 3b would attain all chemical-, location- and action-specific ARARs/media clean-up standards in the long term.
- Alternatives 2a, 2b, 3a, modified 3a, and 3b utilize slope stabilization and erosion control measures and provide soil

cover over waste and impacted soil. These actions minimize waste migration into surrounding sediment and surface water and eliminate human and ecological contact with the waste contents of the causeway.

- Alternative 1 would not comply with several location-specific ARARs (e.g., Executive Orders pertaining to floodplain management and protection of wetlands and the Coastal Management Act). Additionally, Alternative 1 would not comply with several federal and state action-specific ARARs regarding final cover requirements for landfills.

Long-Term Effectiveness

- Alternatives 2a, 2b, 3a, modified 3a, and 3b comprise remedial components for preventing the migration of wastes and reducing risks to human and ecological receptors that are reliable and readily available. The controls (e.g., long-term monitoring and land use controls) would be adequate in determining and ensuring the reliability and effectiveness of the interim remedy.
- No controls would be in place to determine whether Alternative 1 would be reliable and effective in the long term.

Reduction in the Toxicity, Mobility, or Volume Through Treatment

- These alternatives do not reduce the toxicity, mobility, or volume of the surface soil COCs other than any reduction that would result from biodegradation, natural dispersion, dilution, or other attenuating factors. Although a statutory preference for treatment exists for CERCLA remedial actions, the Presumptive Remedy for CERCLA Municipal Landfill Sites establishes containment as the presumptive remedy for landfills similar in nature to Site/SWMU 3 because the volume and type of the waste in municipal landfills generally make treatment impracticable.

Short-Term Effectiveness

- Under Alternatives 2a, 2b, 3a, modified 3a, and 3b, vegetation along the sides of the causeway would be removed, possibly affecting the adjacent wetlands.
- However, measures to minimize the impact on the wetlands during bank stabilization would be employed.
- Workers would be protected during implementation of this remedy through the use of personal protective equipment.
- The remedial action objectives will be achieved when the cover is completed in approximately 1.5 years.

Implementability

- The implementation of Alternatives 2a, 2b, 3a, modified 3a, and 3b is technically and administratively feasible. This evaluation criterion is not applicable to Alternative 1.

Cost

- The costs of the alternatives are as follows. Note that the cost estimates presented in this proposed plan do not include efforts associated with sediment remediation.

State Acceptance

- South Carolina concurs with this interim proposed remedy.

Community

- Community acceptance will be determined based on comments received during the public comment period.

Alternative	Capital (\$)	Operating (\$/year)	30-Year Present Worth (\$)
1	0	0	0
2a	4,094,000	55,400 to 71,400	4,835,000
2b	4,527,000	55,400 to 71,400	5,267,000
3a	4,160,000	55,400 to 71,400	4,901,000
Modified 3a	4,722,000	58,700 to 74,700	5,500,000
3b	4,652,000	55,400 to 71,400	5,392,000

What's a Formal Comment?



Formal comments are used to improve the clean-up proposal. To make a formal comment, you need to present your views during the public meeting or submit a written comment during the 45-day comment period. The public meeting will be held on June 27, 2000 at Technical College of the Low country, 921 Ribaut Road, Beaufort, South Carolina 29902 starting at 6:30 P.M. Written comments should be sent to:

Commanding General
Marine Corps Recruit Depot
Attn: Timothy J. Harrington, NREAO
P.O. Box 19003
Parris Island, SC 29905-9003
Tel: 843-228-3423
E-mail comments by July 27, 2000 to
email: harringtontj@mcrdpi.usmc.mil



The MCRD Parris Island and U.S. Navy will review the transcript of all comments received at the public meeting and all written comments received during the formal comment period before making a final clean-up decision. They will then prepare a written response to all comments. The transcript of comments and the MCRD Parris Island and U.S. Navy's written responses will then be issued in a document called the Community Responsiveness Summary in the interim ROD.

For More Detailed Information

To help the public understand and comment on the proposal for the site, this publication summarizes a number of reports and studies. All the technical and public information publications prepared to date for the site are available at the following information repository:

Beaufort County Public Library's Headquarters Location
311 Scott Street
Beaufort, South Carolina 29902



Use This Space to Write Your Comments or to be added to the mailing list

The MCRD Parris Island and U.S. Navy want your written comments on the options under consideration for Site 3. You can use the form below to send written comments. If you have questions about how to comment, please call Tim Harrington at (843) 228-3423. This form is provided for your convenience. Please mail this form or additional sheets of written comments, postmarked no later than July 27, 2000, to

Commanding General

Marine Corps Recruit Depot

Attn: Timothy J. Harrington, NREAO

P.O. Box 19003

Parris Island, SC 29905-9003

Tel: 843-228-3423

E-mail comments by July 27, 2000 to

email: harringtontj@mcrdpi.usmc.mil

(Attach sheets as needed)

Comment submitted by: _____

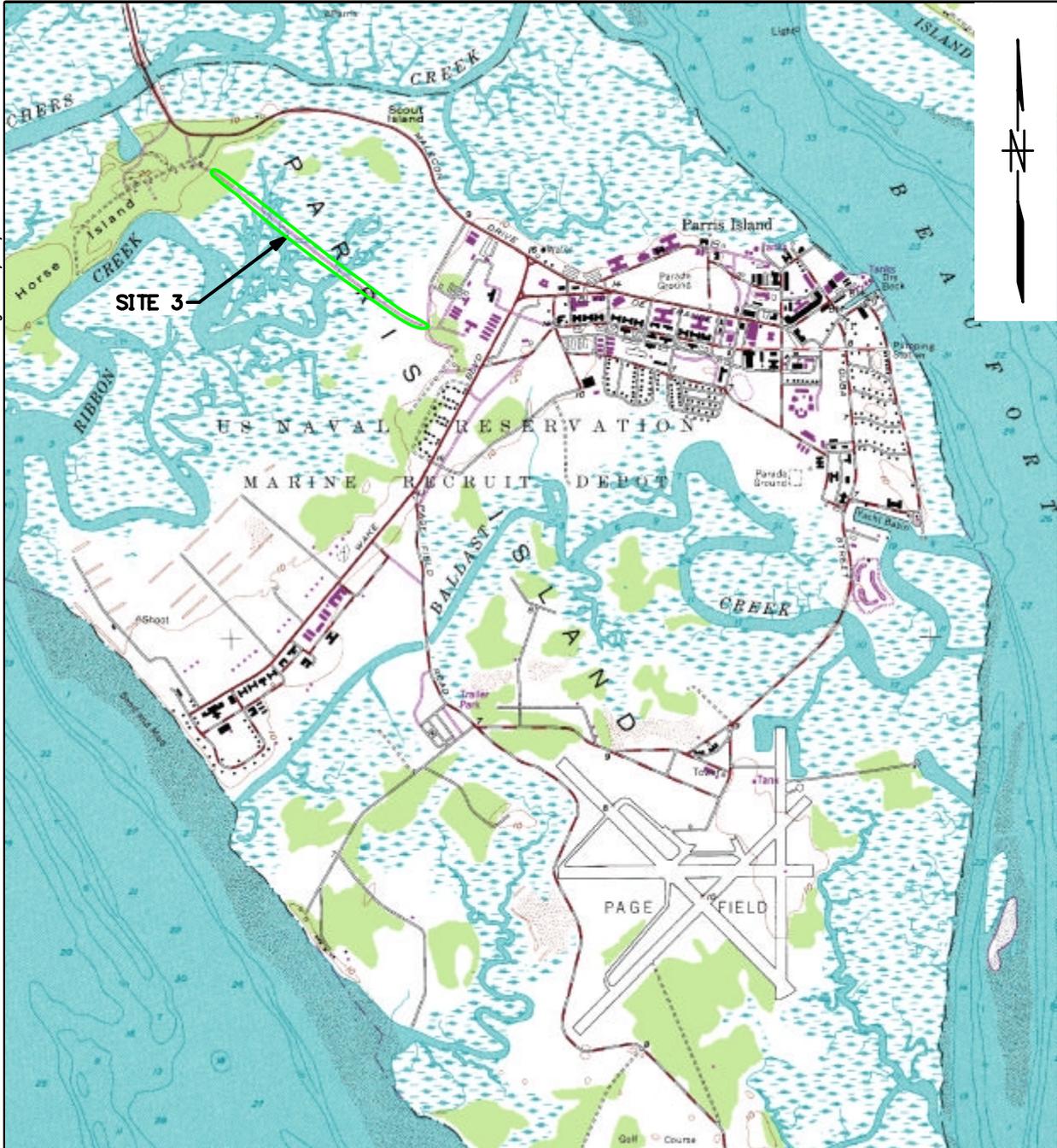
Mailing list additions, deletions, or changes

If you did not receive this through the mail or would like to

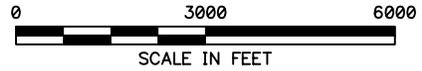
- | | |
|---|----------------|
| <input type="checkbox"/> be added to the site mailing list | Name: _____ |
| <input type="checkbox"/> note a change of address | Address: _____ |
| <input type="checkbox"/> be deleted from the mailing list | _____ |
| <input type="checkbox"/> obtain additional information
concerning the Restoration Advisory Board | _____ |

please check the appropriate box and fill in the correct address information above.

ACAD:7394CM65.dwg 04/11/00 HJP



SOURCE: USGS 7.5 MINUTE PARRIS ISLAND QUADRANGLE, 1956. PHOTOREVISED 1979.



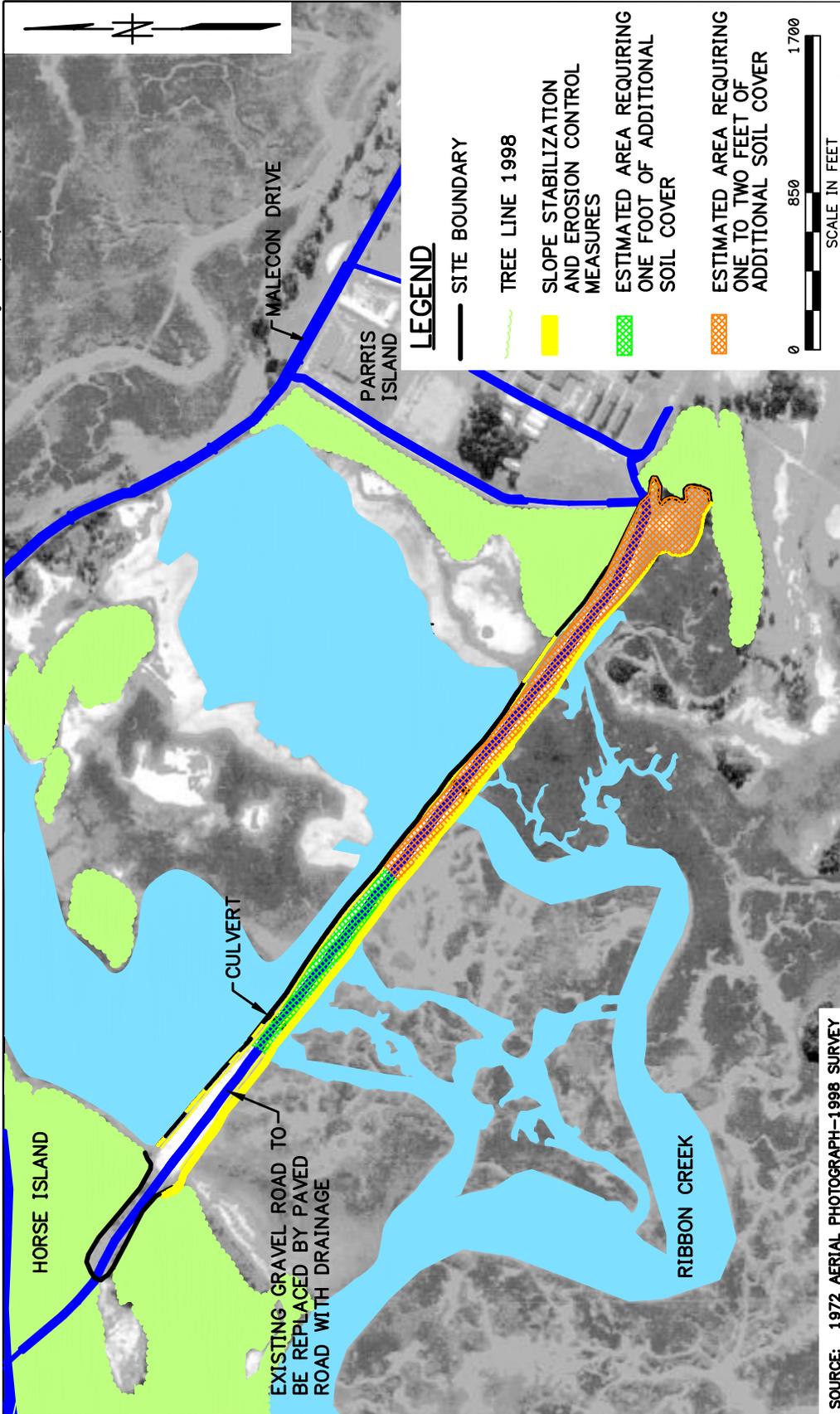
DRAWN BY HJP	DATE 4/2/00
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE AS NOTED	



**SITE/SWMU 3 AND
DEPOT LOCATION MAP
MCRD PARRIS ISLAND, SOUTH CAROLINA**

CONTRACT NO. 7394	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV. 0

FORM CADD NO. SDIV_AV.DWG - REV 0 - 1/20/98



CONTRACT NO. 7394	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	FIGURE 2
	REV. 0

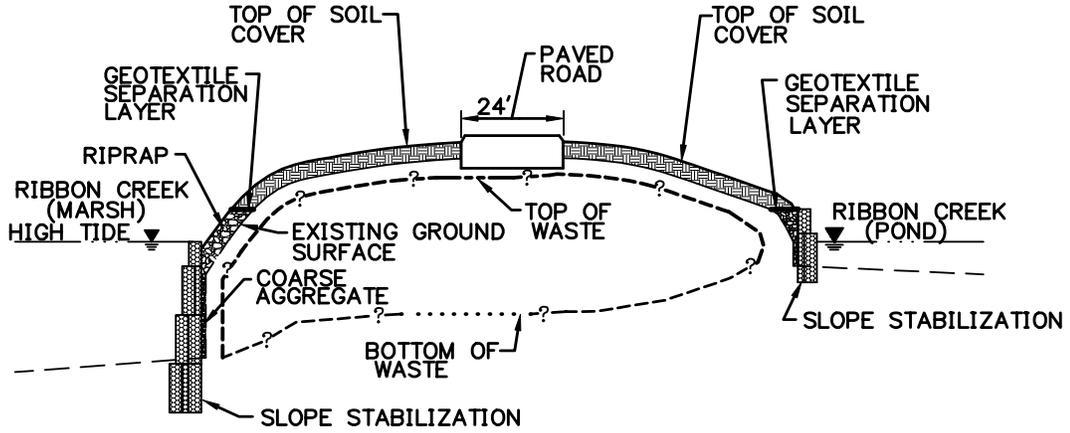
**PROPOSED INTERIM REMEDY
SITE/SWMU 3 - CAUSEWAY LANDFILL
MCRD PARRIS ISLAND, SOUTH CAROLINA**



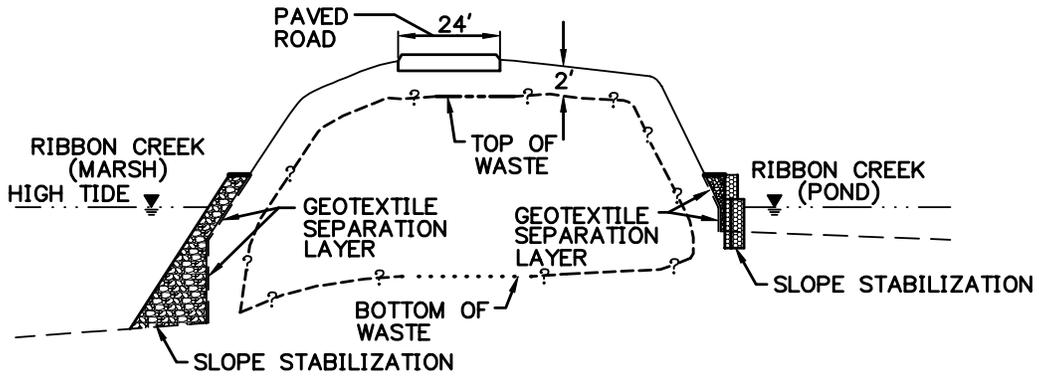
SOURCE: 1972 AERIAL PHOTOGRAPH-1998 SURVEY	
DRAWN BY HJP	DATE 4/3/00
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE AS NOTED	

ACAD: 7394GX1 4.dwg 04/26/00 HJP

PROPOSED REMEDY (1 FOOT ADDITIONAL COVER)



PROPOSED REMEDY (2 FEET COVER MINIMUM)



LEGEND:

- EXISTING GROUND SURFACE (DASHED WHERE INFERRED)
- TOP OF WASTE (DASHED WHERE INFERRED)
- BOTTOM OF WASTE (DASHED WHERE INFERRED)

DRAWN BY HJP	DATE 4/11/00
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE NOT TO SCALE	



TYPICAL CROSS SECTIONS
SITE/SWMU 3 - CAUSEWAY LANDFILL
MCRD PARRIS ISLAND, SOUTH CAROLINA

CONTRACT NO. 7394	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 3	REV. 0

FORM CADD NO. SDIV_AV.DWG - REV 0 - 1/20/98